

# Effects of Flip Instruction on Students Academic Achievement and Retention in Developmental Psychology Course

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**Abstract-** This study investigated the effect of flip instruction on students' academic achievement and retention in Abia State College of Education (Technical) Arochukwu. Accordingly, two research questions and two null hypotheses were formulated to guide the study. The population of the study consisted of 80 NCE 1 (Nigeria Certificate in Education) students. The 80 students were randomly assigned to experimental and control groups. The experimental group received lessons on specific topics in developmental psychology using flip instruction while the control group received lessons on the same topics using traditional instructional method. Both the experimental and control groups were then tested. After two weeks both experimental and control groups were again tested using the same first test questions. Mean statistic was used to answer the two research questions while on the other hand t-test statistic was used to test the two null hypotheses, all using the data collected from the tests. The finding from the study after data analysis shows that the students taught with flip instruction (experimental group) perform better than those students taught with traditional method (control group) in achievement test. Furthermore, the flip instruction group performed less than the traditional instruction group in terms of retention ability. On the issue of hypotheses testing, there was significant difference in the mean scores of the two groups for both first cognitive achievement test and no significant difference in retention test. Based on these results, the researchers recommended the use of flip instruction in developmental psychology course in Abia State College of Education (Technical) Arochukwu.

**Keywords:** Flip Instruction, Academic Achievement, retention, Developmental Psychology, Abia State College of Education (Technical) Arochukwu

## I. INTRODUCTION

Abia State College of Education (Technical) Arochukwu was established with the main aim of producing teachers that will teach in both primary and junior secondary schools respectively. The

College consists of Six Schools, namely, School of Arts and Social Sciences, School of Business education, School Science education, School of Technical education, School of Vocational education and School of education respectively. School of education offers general and compulsory educational courses at all the three levels (that 100,200 and 300) At 100 level first semester, students offers several general and compulsory educational courses. Developmental Psychology is one of the general compulsory courses offer by 100 level students in first semester in the School of education (NCCE, 2020).

Psychology in simple terms is the study of behavior. The behavior can be that of human or animal. Psychology has various branches such as general psychology, human and animal psychology, industrial psychology, criminal psychology, military psychology, normal and abnormal psychology, experimental psychology, physiology psychology and educational psychology. Educational psychology according to Parhi(2013) is the application of psychological principles in the field of education. In specific, educational psychology is concern with the study of how best educators can induce or make learning easy. Thus, educational psychology remove stumbling block to learning (Cliford, 2004). However, achieving this feat requires the combination of educational principles, learning theories as well as knowledge in developmental psychology among others.

Developmental psychology deals with physical, mental, emotional, personal and social development as well as development of attitudes, interest and values of learners. In other words, developmental psychology is concern about the knowledge of the learners, their attitudes, interest, abilities, aptitudes, developmental stages, influence of environment, the

needs and requirements of the children go on changing from time to time, stage to stage and from environment to environment (Parhi, 2013). The course contents of developmental psychology include principles of human growth and development, adolescent, theories of personality development, individual differences, differences, heredity and environment, theories of adolescent, growth and development during adolescence, educational implications of early and late maturation, challenges of the adolescent in the home, school and society and educational interventions during adolescence, approaches, strategies and counseling among others (NCCE, 2020).

A careful examination of the above contents revealed that some of the contents are abstract in nature and broad as well. Furthermore, the course is offered by all 100 level students, thereby making the class size large. These factors and more combine to make teaching of the course challenging and often result to high rate of failure. To reduce the rate of failure in this course, the researchers set out to find out whether a flip instruction technique will be of great help in area of increasing students' academic achievement.

## II. PROBLEM STATEMENT

Developmental psychology is one of the general and compulsory courses offered by all 100 level students in first semester in the School of Education. The main objective of the course is the understanding of the developmental characteristics of pupils as well as structuring of learning experiences to suit each stage of their development. Some of the contents of the course are abstract as well as broad in nature. As a general course, the class size is large. Furthermore, the implementation of the course is characterized with students' late coming and truancy. These factors and more combine to make the teaching of the course more challenging. One of the consequences of these factors is high rate of failure among students compared with other general and compulsory courses in the school. This is evident from the past records of students' results in the course. Hence, the researchers set out to find whether flip instruction technique can reduce the failure rate in the course.

## III. OBJECTIVES OF THE STUDY

The objectives of the study are as follows:

1. To determine the effect of flip instruction on student's academic achievement in developmental psychology.
2. To determine the effect of flip instruction on student's retention in developmental psychology.

## Research Questions

Based on the above objectives, the following research questions were formulated to guide the study;

1. What is the effect of flip instruction on student's academic achievement in developmental psychology?
2. What is the effect of flip instruction on student's retention capability in developmental psychology?

## Hypotheses

The following null hypotheses were formulated to guide the study. They were tested at 0.05 level of significance.

1. There is no significant difference in the Mean Scores of Students taught developmental psychology with flip instruction and traditional method in developmental psychology achievement test.
2. There is no significant difference in the Mean Scores of Students taught developmental psychology with flip instruction and traditional method in retention test.

## IV. LITERATURE REVIEW

This section presents the concepts of academic achievement and retention. The section also presents the concept of flip instruction and types. The section ends with some empirical studies on flip instruction.

### *Concept of Academic Achievement*

Academic achievement is one of the variables that describe the success of students in their educational pursuit. Iwundu (2001) defined academic achievement as the level of success attained at the end of an academic endeavour. Tukura (2015) opines that academic achievement connotes attainment in a school subject as indicated by a score or marks on a test. Academic achievement can be viewed as the test results of students after completing a school-based learning (Lee, Chao & Chen, 2011). There several

factors that influence students academic achievement. Prominent among are attitude, interest and motivation. Student's attitude determines their engagement in classroom activities. Hall and Poolcci(1999) defined attitude as a fairly consistent learned tendency to behave in a certain way. Forsey and Glance (2013) refer learning attitude as a relatively stable psychological tendency that a student shows towards learning. It may be determined by observation, or described as, the attention paid, emotions displayed and mental status that student shows while learning. Attitude is influence by several factors such environmental factors, social factors, emotions and motivations among others. Motivation is the force that drives humans toward activities. Soleymanpour (2014) refer motivation as the internal mode of an organization that cause to direct ones behavior toward a goal. Psychologists believe that motivation is necessary ingredient for learning (Biehler & Snowman,1986).They also believe that satisfactory school learning is unlikely to take place in the absence of sufficient motivation to learn(Fontana,1981).Tella(2007) found that motivation impacted positively on academic achievement in mathematics.

Retention is another factor that is of significant value in educational context. Retention according to Umar, Idris, Audu, Arah, Yusuf & Beji (2014) is the ability to reproduce the learnt concept when the need arises. There are numerous studies showing that teaching technique or method has an influence on students' retention of learning. In this context, Cyril (2016) conducted a study on the effects of multimedia instruction on students' retention and achievement of basic machining skills in mechanical craft practice and found that students in multimedia instructional group (experimental group) performed better in mechanical craft practice and in retention test than those in the control group. This result among others highlights the effect of teaching method or technique on students' achievement and retention as well. Hence, this study set out to find the effect of effect of flip instruction on students' academic achievement and retention in developmental psychology course.

#### *Concept of Flip Instruction*

Flip is a term used to mean turn over, reverse or invert. Hence, flipped classroom is a type of classroom where tasks and lectures are given to students before class and assignment, exercise and

home work are done in class under the supervision of a teacher. In this sense, Kadry and El-Hami (2014) describe flipped classroom as a teaching innovation model where the typical lecture and assignment elements of a course are reverse. In the same vein, Bergman and Sams (2012) stated that flipped classroom is a new educational technique which seeks to invert the traditional model of in class lecture and out of class homework. Flipped class allow students to have overall concepts of the subject matter before face-to-face discussion with teacher such as solving practical problems, discussing case studies, doing assignment and homework, making protects and discussing imported issues on the topic (Roth, 2016). In this way, flipped classroom move the traditional classroom away from more dissemination of information to problem solving and active learning class. In addition flipped class increases students learning time as they can review instructional material before face-to-face instruction.

The instructional materials to be reviewed by students before face-to-face class were in form of print lecture notes. However, with the advent of internet couple with advances in web technologies, such instructional materials are in form interactive computer based instructional materials such as interactive multimedia instruction, audio recording, video, blog or podcast. Computer –based instructing enable students to engage in active learning and study at their own pace. The use of computer base learning in flipped classroom led to the inclusion of video lectures in definition of flipped classroom, for example, maninun, kanokkarn and wattaparkal (2017) defined flipped classroom as a new pedagogical method, which employs asynchronous video lectures at home and practice solving problems at school. This definition has clearly shown that flipped classroom combines the traditional face-to-face instruction, thereby making it to assume the dimension of blended learning. Thus, flipped classroom or learning is referred to as a type of blended learning where the traditional face-to-face learning is combined with computer-based instruction.

The face-to-face interaction between students and teacher and the lectures receive by students before class defined the components of flipped classroom. In this context, Bishop and Verleger (2013) described flipped classroom as consisting of two parts: Interactive group learning activities inside the

classroom, and direct computer based individual instruction outside the classroom. Flipped classroom convert class time into a workshop where students can inquire about lecture content, test their skills in applying knowledge, and interact with one another in hands-on activities. During class sessions, instructors function as coaches or advisors, encouraging students in individual inquiring and collaborative effort (Educate Learning Network, 2014).

There are different types of flipped classroom. This include traditional flipped classroom. In a traditional flipped classroom, students arrives class having watched an assigned video lecture in the evening before class. Class begins with a short questions-and – answer session to allow students to seek clarification on any confusion from the video. Following this, students typically engage in a hands-on-inquiry based activity for the remaining of class period, while the teacher surveys the classroom and offers one-on-one support to students. This class structure then continues daily. The daily lesson is always delivered through video format, outside of school homes, and never through teacher directed lesson. Thus, traditional flipped classroom is suitable for small size considering the role of teacher in supporting students individually (Bergman, 2012; Bajurny, 2015). Partial flipped classroom is another type of flipped classroom often used by some teachers. The partial flip classroom structure is essentially a less strict version of the traditional flip model. In this type of class, teacher encourages students to watch videos outside of class hours as enrichment activities. Students do not solve homework or assignment in this type of flipped classroom (Springen, 2013). Mastery-based flipped classroom is another type of flipped classroom that is often used by the teacher. In mastery-based flip classroom, students are given an outline of all the units, along with objectives, assignment and a variety of resources (videos, texts, worksheets (Bergmann, 2012). Students are expected to complete units at their own pace, along with teacher support. Flipped classroom has characteristics that are different from those of traditional classroom. Such characteristics are usually discussed under flexible environment (F), learning culture (L), Intentional context (I) and Professional Educators (P).

Flexible environment implies educators creating flexible spaces in which students choose when and where they learn. They often physically rearrange

their learning space to accommodate a lesson or unit and support either group work or independent study. Furthermore, educators who flip their classes are flexible in their expectations of student's time lines for learning and in their assessments of students learning. In the traditional teacher centered model, the teacher is the primary source of information. By contrast, the flipped learning model deliberately shifts instruction to a learner-centered approach, where –in-class time is dedicated to exploring topics in greater depth and creating rich learning opportunities. As a result, students are actively involved in knowledge construction as they participate in and evaluate their learning in a manner that is personally meaningful. Flipped learning educators continually think about how they can use the flipped learning model to help students develop conceptual understanding, as well as procedural fluency. They determine what they need to teach and what materials students should explore on their own. Educators use intentional context to maximize classroom time in order to adopt methods of students –centered, active learning strategies, depending on grade level and subject matter. The role of a professional educator is even more important and often more demanding in a flipped classroom than in a traditional one. During class time, educators continually observe their students, providing them with feedback relevant to that moment and assessing their work. Professional educators are reflective in their practice, connect with each other to improve their instruction, accept constructive criticism and tolerate controlled chaos in their classrooms. While professional educators take on less visibly prominent roles in a flipped classroom, they remain the essential component that enable learning to occur. (Flipped Learning Network, FLN, 2014).

#### *Empirical Studies on Flip Instruction*

There are many empirical studies that suggest that flipped classroom teaching technique improve students' academic achievement. Evidently, Paristiowati, Fitriani and Aldi (2017) conducted study on the effect of inquiry-flipped classroom model toward student's achievement on chemical reaction rate. The research was conducted in SMA Negeri 3 Tangerang Selatan in the odd semester of academic year 2016/2017. After data analysis, it was found that the students' achievement in inquiry-flipped classroom is better than guided inquiry. Similarly, EL-Bossuony (2016) conducted a study on the effectiveness of flipped learning in developing

English Grammatical performance of underachieving language learners at the secondary stage. The results of the study revealed that flipped learning significantly developed English grammatical performance in speaking and writing of both underachieving language learners and their normal peers. Bhagat, Chang and Chang (2016) on the other hand, carried out a study on the impact of the flipped classroom on mathematics concept learning in high school. The study aimed to examine the effectiveness of the flipped classroom learning environment on learner's learning achievement and motivation, as well as to investigate the effects of flipped classrooms on learners with different achievement levels in learning mathematics concepts. Findings indicated a significant difference in the learning achievement and motivation between the two groups with students performed better using the flipped classroom. Further analysis showed a significant difference in the performance of low achievers in the experimental and control groups. Guy and Marquis (2016) compared student performance in two different classroom environments, traditional versus flipped. The study spanned 3 years, beginning fall 2012 through spring 2015. The participants included 433 declared business majors who self-enrolled in several sections of the Management Information Systems course during the study. The results of the show that the flipped classroom approach offers flexibility with no loss of performance when compared to traditional lecture-based environments. The high academic achievement of students in flipped classroom can be attributed to motivation, student's attitude toward learning and interest among others. In one study, Dixon (2017) investigated the effect of flipped classroom on urban High school students in a high school science subject. Data analysis revealed significant difference between flipped and traditional class settings on motivation in favour of flipped classroom teaching technique. In another study, ALRowas(2014) investigated the

impact of flipped learning on achievement and attitudes in higher education. The study showed that there were positive effects of both students' achievement and their attitudes towards studying courses.

Sirakaya and Ozdemir (2018) conducted a study on the effect of a flip classroom model on academic achievement, self- directed learning readiness, motivation and retention. The findings of the study showed that there was a significant difference between groups in terms of academic achievement, motivation and retention. However, no significant difference between the experimental and control groups in terms of self-directed learning readiness.

The impressive effects of flipped classroom teaching technique as evidence in areas of increasing student's motivation, retention, attitude and academic achievement prompted the researchers to find the effect of flipped classroom on student's achievement and retention in developmental psychology in Abia State College of education (Technical) Arochukwu.

## V. MATERIALS AND METHOD

The research was conducted in the department of educational Psychology, Abia State College of Education (Technical) Arochukwu. The population of the study consisted of 80 NCE 1 students. There was no sample and sampling technique as the whole population was used for the study. The instrument for the study is Developmental Psychology Test (DPT). The instrument was used for both achievement and retention tests. The study adopted t-test as the design of the study. Accordingly, the study has experimental and control groups respectively.

### *Experimental Procedure*

#### *Treatment of Experimental and Control groups*

The conduct of the treatment of the experimental and control group was organized in the following manner:

Experimental group	$0_1$	$X_1$	$0_2$
Control group	$0_1$	$X_2$	$0_2$

Where

- $X_1$  = Flip instruction treatment
- $X_2$  = Traditional instruction treatment
- $0_1$  = Pretest in the experimental and control groups
- $0_2$  = post test in the experimental and control groups

*Control of Extraneous Variables*

Issues such as initial group difference, researchers bias, variability of instructional situation and effect of pretest on Post test were controlled during the study.

*Pre-test and Post-test Phases*

Both experimental and control groups sat for the same Developmental Psychology Test (DPT). Thereafter, the researchers collect the answer scripts of the two groups and score them using the marking guide prepared by the researchers. After treatments to the two groups, the same test was administered to the two groups. Again, after two weeks the same test was administered to the two groups to get data for the retention. In each case, the researchers mark subjects' scripts and collect data.

*Method of Data Analysis*

Research questions were answered using mean while t-test was used for testing two null hypotheses of 0.05 level of significance. When the p- value (0.05) is less than the p-value associated with the F- calculated value for experimental and control groups, the null hypothesis will not uphold. The null hypothesis on the other hand will be upheld when p-value associated with the F-calculated value for experimental and control groups is greater than the p-value (0.05).

VI. RESULTS

*Research Question 1*

What is the effect of flip instruction on student's academic achievement in developmental psychology?

Table 1 provides data for answering research question 1.

*Table 1: Mean and Standard Deviation of Pretest and Posttest Scores of Experimental and Control Groups on Students Cognitive Achievement as Measured by Developmental Psychology Test*

Group	N	Pretest Score		Posttest score		Mean Gain
		$\bar{X}$	SD	$\bar{X}$	SD	
Experimental	43	3.72	4.32	10.72	2.61	7.00
Control	37	3.42	3.86	6.89	5.31	3.47

The Table 1 shows the Means, standard deviations as well as the Mean gains of experimental and control groups before and after treatments. The Table reveals that the experimental group had Mean score of 3.72 in pretest and 10.72 in post-test, giving rise to mean gain of 7.00. The Mean gain of 7.00 indicates the effectiveness of flip instruction. The Table also shows the Mean score of control group in pretest and post-test as 3.42 and 6.89 respectively, which gave rise to a mean gain of 3.47. This Mean gain of 3.47

implies the effectiveness of conventional teaching method, These two results shows that experimental group perform better than the control group in achievement test.

*Research Question 2*

What is the effect of flip instruction on student's retention capability in developmental psychology?

Table 2 shows the data for answering research question 2.

*Table 2: Mean and Standard Deviation of Post-test and Retention-test Scores of Experimental and Control Groups on Students Retention as Measured by Developmental Pyschology Test*

Group	N	Posttest Score		Retention test score		Mean Gain
		$\bar{X}$	SD	$\bar{X}$	SD	
Experimental	43	10.72	2.61	10.82	3.54	0.10
Control	37	6.89	5.31	10.76	3.24	3.87

The Table 2 shows the Mean score of experimental group in post-test as 10.72 .In retention-test, the Mean score rose to 10.82 making the Mean gain for the group to be 0.10..Control group had Mean score

of 6.89 in post-test and 10.76 in retention-test, giving rise to Mean gain of 3.87. The large Mean gain value of 3.87 for the control group reveals that the control

group outperformed the experimental group in retention ability.

There is no significant difference in the Mean Scores of Students taught developmental psychology with flip instruction and traditional method in developmental psychology achievement test.

*Hypothesis 1*

*Table 3: T-test analysis of means scores of the posttest of students taught with flip instruction and those taught with the traditional instruction using cognitive achievement test.*

Group	N	Mean	SD	df	t-value
Experimental	43	10.72	2.61	78	3.995
Control	37	6.89	5.31		

Table 3 shows the means and standard deviations for experimental and control groups as well as calculated t-value. The calculated t-value of 3.995 is greater than the table value of 1.080 at 0.05 level of significance and 78 degree of freedom. Therefore, the null hypothesis is rejected and alternative is adopted. This implies significant difference in the mean scores in favour of experimental group.

*Hypothesis 2*

There is no significant difference in the Mean Scores of Students taught developmental psychology with flip instruction and traditional method in retention test.

*Table 4: T-test analysis of means scores of the posttest of students taught with flip instruction and those taught with the traditional instruction using retention cognitive achievement test.*

Group	N	Mean	SD	df	t-value
Experimental	43	10.82	3.54	78	0.065
Control	37	10.76	3.24		

The data in table 4 indicates the means and standard deviations for both experimental and control groups. The calculated t value of 0.065 is less than the table t of 1.080. This implies that the null hypothesis is upheld.

peers. This study also supports the finding of this study in terms of academic achievement. However, the study conducted by Sirakaya and Ozdemir (2018) corroborated the finding of this study in terms of academic achievement, but not in line with the finding of this study in terms of retention of knowledge.

VII. DISCUSSION OF FINDINGS

Many studies were conducted to test the efficacy of flip instruction and a great number of them showed its efficacy. Paristiowati, Fitriani and Aldi (2017) carried out a study on the effect of inquiry-flipped classroom model toward student's achievement on chemical reaction rate. The result of their study revealed that the students' achievement in inquiry-flipped classroom is better than guided inquiry. This result supports the finding of this study in terms of academic achievement. In a similar study, EL-Bossuony (2016) conducted a study on the effectiveness of flipped learning in developing English Grammatical performance of underachieving language learners at the secondary stage. The results of the study revealed that flipped learning significantly developed English grammatical performance in speaking and writing of both underachieving language learners and their normal

VIII. CONCLUSION

Developmental psychology course is a general and compulsory course for all NCE 1 students. It is on the record that many students in the College have been failing the course for more than five years. There an array of factors that are responsible for this ugly situation. One of such factors could teaching method/technique. The researchers then proposed flip instruction as a teaching method that could improve students' academic achievement. To test the effectiveness of this teaching method, 80 NCE 1 were randomly assigned into experimental and control groups. Students in the experimental group were taught with flip instruction while those in the control group received instruction using conventional teaching method. The results of data analysis revealed that students taught with flip instruction

(experimental group) performed better than those taught with conventional method (control group). In terms of retention, students taught with conventional method outperformed those taught with flip instruction. For hypotheses tests, the study revealed that there was significant difference in the mean scores of the experimental and control groups in the achievement test and no significant difference in the retention test.

#### IX. RECOMMENDATIONS

Based on the findings of this study, the following recommendations were made:

1. Flip instruction teaching method/technique should be integrated into teaching and learning of developmental psychology in the College.
2. The College should organise a capacity building workshop on flip instruction for lecturers of department of psychology.

#### X. ACKNOWLEDGMENTS

The authors are grateful to the Tertiary Education Trust Fund (TETFund) for financial support towards the realizations of this project. The authors are also grateful to the College management for providing enabling environment that led to the completion of this project.

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